

10/019,182

Rec'd PTO 22 APR 2002



DUFEK, Otto K.; 71364 Winnenden

### Optical Apparatus

The invention is based on an optical apparatus (binoculars, camera and the like) for the optical detection of objects (geographical locations, persons, vehicles, and the like), whose identifying data are stored in satellite-aided transmission systems. This optical apparatus is intended to contain a component for the optical fine focusing on such an object viewed via a target line. Target line is defined here as the axis between apparatus and object, which is defined, of course, with reference to the compass direction into which the apparatus is pointed, but also by how far the apparatus is rotated above or below horizontal. Furthermore, this apparatus is intended to contain a component to detect the distance between apparatus and the object, which may be done with optical or other means, where the display of the distance is to consist of data, such as electronic data, that can be processed further. Furthermore, the apparatus is to contain a measurement unit to detect the angle of incline between global identification lines, such as magnetic identification lines, and the target line. Furthermore, the apparatus is to contain a receiving unit to receive signals from satellites, and it is to contain a computer for data processing, which can process the distance data described above, data regarding the angle of incline, satellite signals as well as the data of the satellite-aided transmission systems or their storage. Then there is also an information display for the targeted display of data regarding the object, where the desired result of the computation is displayed automatically, for example as data from the satellite-aided transmission system, such as is well known in the case of locating, orienting and navigating of persons or vehicles with such satellite-aided transmission systems.

For a known optical apparatus of this type (DE-OS 43 12 310), the objects are detected by the computer using the data of a satellite navigation system and the compass heading and their identification is "verified cognitively". This is achieved by the intersection of two vectors, specifically first the heading vector of the compass and second the location vector of the satellite system. The disadvantage of this apparatus consists of requiring a subsequent check of the information data and the object, because there is no reliable designation.

However, the computer of this invention processes also the distance value, which may vary with fine focus, and its program is designed such that data regarding the currently selected object will appear on the information display after fine focusing. The advantage here is primarily the clean and reliable designation of information data for the object, such as a village, a specific person or a specific vehicle. Thus, such an apparatus can be used in many applications, such as in research or exploration projects, but also in emergencies and last but not least by the military, where errors may have particularly grave results.

In an advantageous embodiment of the invention, the computer works exclusively with electronic inputs.

In an additional advantageous embodiment of the invention, the display consists of a display unit with an LCD (liquid crystal display) with transparent electrodes on the display surface.

An additional advantageous embodiment of the invention uses a printer as the display to print out the results.

An additional advantageous embodiment of the invention uses an apparatus to process the data into acoustical signals and a loudspeaker as the display.

An additional advantageous embodiment of the invention uses binoculars as the basic apparatus. The viewing area of these binoculars may then include a display such that the viewer learns the identity of the object immediately after focusing on the object.

An additional advantageous embodiment of the invention uses a navigation satellite system for the location determination of the optical apparatus. Such systems are known, specifically to locate, for example, persons and vehicles for navigation within urban areas. In an additional advantageous embodiment of the invention, the measurement unit cooperates with a compass to detect the azimuth angle between the target line and the North-South direction.

An additional advantageous embodiment of the invention uses a height-measuring device to detect the elevation angle between the target line and the horizontal and/or the vertical.

Other advantages and advantageous embodiments of the invention may be derived from the claims.

All of the characteristics shown in the description and the following claims may be essential to the invention by themselves or in any possible combination with each other.